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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,216	12/12/2001	Minoru Yamada	01802/HG	8903
1933	7590	10/03/2005	EXAMINER	
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC			TUGBANG, ANTHONY D	
220 5TH AVE FL 16			ART UNIT	
NEW YORK, NY 10001-7708			PAPER NUMBER	
			3729	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

ST

Office Action Summary	Application No. 10/021,216	Applicant(s) YAMADA, MINORU	
	Examiner A. Dexter Tugbang	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 3-7 and 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The applicant(s) amendment filed on 2/18/05 has been fully considered and made of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

3. The restriction requirement (dated 9/8/04) is hereby repeated. The applicant(s) continue to acknowledge the election of Species A, Claims 1, 2, and now included in this election is newly added Claims 8 and 9, which are also directed to Species A.

Claims 3-7 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9/15/04.

4. Newly submitted Claims 10-13 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 10-13 are directed to Species B, Figure 9, which is an invention non-elected.

Since applicant has received an action on the merits for the originally presented invention (Species A), this invention has been constructively elected by original presentation for prosecution on the merits.

Accordingly, Claims 10-13 have been withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 9, there are two significant problems that render the claim as being vague, indefinite and confusing. First, the phrase of “the head substrate” (line 1) lacks positive antecedent basis. It appears that this phrase should be referring to the previous recitation of the “channel plate” (line 8 of Claim 1). Second, what material is the recitation of “is plated by an electroless plating” (lines 1-2) previously referring to? Is this recitation referring to the “thin-film plating layer” (lines 9-10 of Claim 1), or is this referring to the “additional plating layer” (line 14 of Claim 1).

Claim Rejections - 35 USC § 103

7. With respect to Claims 1 and 2, the rejection below is maintained and hereby repeated below merely for the applicant(s) convenience.

8. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of four total references:

Temple et al 5,185,055, referred to hereinafter as Temple’055;

Temple 5,016,028, referred to hereinafter as Temple’028;

Wojnarowski et al 5,302,547; and

Sakamoto et al 4,725,345.

Temple'055 discloses a method of manufacturing an ink-jet print head comprising: forming on a surface of a channel plate 1 (in Figs. 3a-3e) having a plurality of grooves 29 for the ink channels, a thin-film plating layer (silicon nitride layer 25) by deposition which has a thickness taken in the vertical direction; removing a part of the thin-film plating layer 25 (see sequence of Figs. 3a to 3b); and plating the channel plate 1 thereby forming an additional plating layer 27 on the thin-film plating 25 on a portion that has not been removed by any laser beam in which the additional plating layer forms electrodes. The claimed "desired thickness" is read as the dimension taken from the top surface of the additional plating layer 25 above the channel plate 1 to the bottom surface of the additional plating layer taken in the middle of the channels 29.

Regarding Claim(s) 1, Temple'055 does not mention that the thin-film plating layer, read as silicon nitride layer 25, is formed by plating. Temple'055 also does not teach that part of the thin-film plating layer is removed by a laser beam, but rather that part of the thin-film plating layer is removed with a saw or saw cutting means.

To form a thin-film plating layer of silicon nitride by plating is a conventional, old and notoriously well known method of deposition in the art. As evidence of obviousness, the examiner cites Sakamoto (at col. 8, lines 54-58), which teaches ion plating a thin-film plating layer of silicon nitride. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Temple'055 by forming the thin-film

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plating layer specifically by plating, as taught by Sakamoto, to positively provide an alternative means of coating or depositing a thin-film plating layer.

Wojnarowski et al teaches that one means of patterning a thin-film plating layer, i.e. a silicon nitride layer, is by using a laser beam to remove part of the thin-film plating layer (see col. 7, lines 57+ and sequence of Figs. 3a - 3c). The laser beam is also used to form channels 23 in a channel plate layer (either 18 or 20) just beneath the thin-film plating layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the laser beam of Wojnarowski for the saw cutting means of Temple'055, to provide an alternative means of removing part of the thin-film plating layer.

Regarding Claim(s) 2, it is noted that Temple'028 is fully incorporated by reference in Temple'055 (see Temple'055 at col. 6, lines 14-18). Temple'028 suggests that additional plating layers that form electrodes can be made from at least nickel (see col. 4, lines 36-39).

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art above as applied to Claim 1 above, and further in view of Huang et al 5,509,840.

The prior art relied upon above discloses the claimed manufacturing method with the exception of the thickness of the thin-film plating layer being not more than 0.5 μm and, as best understood, that the thin-film plating layer is plated by electroless plating.

It is noted that the thin-film plating layer of Temple'055 includes a material composition of silicon nitride. Huang shows that thin-film plating layers formed of silicon nitride can be formed by electroless plating to a thickness in the range of 0.05 to 0.3 μm (see col. 3, lines 59-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of the prior art above by forming the thin-film plating layer through electroless plating within a thickness range of 0.05 to 0.3 μm , as taught by Huang, to advantageously provide an alternative method of depositing and patterning art recognized equivalent thin-film plating layer materials that include silicon nitride.

Response to Arguments

10. Applicant's arguments filed 2/18/05 have been fully considered but they are not persuasive.

In regards to the merits of the prior art above, the applicant assert that none of the references teach “plating again the channel plate thereby forming an additional plating layer on the thin-film plating which has not been removed by the laser beam” (lines 13-15).

The examiner simply does not understand this argument. Temple'055 was relied upon for the “thin-film plating layer” and the “additional plating layer”, which was read as the silicon nitride layer 25 and plating layer 27, respectively. A portion of the “thin-film plating layer” 25 is removed to form channels 29 (see Fig. 3b) and on the top surface of substrate 1 in between the channels 29, a portion of the thin-film plating layer 25 remains that has not been removed. So when the “additional plating layer” 27 is formed by Temple'055, it is formed on the top surface, or a portion of the top surface, of the “thin-film plating layer” (as shown in Fig. 3d). Thus, the limitations of “thereby forming an additional plating layer on the thin-film plating which has not been removed” is satisfied by Temple'055. Moreover, this limitation in now way excludes other locations that the “additional plating layer” can be formed on, such as within channels 29 of the

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substrate, and it appears that further limitations are needed specifying this location of the “additional plating layer” in order to avoid the prior art above.

Concerning the limitations of “desired thickness”, this was broadly read as any dimension taken along the “additional plating layer”, as the claim recites only one dimension with no other relationship of any other dimensions mentioned. So the “desired thickness” is the dimension taken from the top surface of the additional plating layer above the channel plate 1 to the bottom surface of the additional plating layer taken in the middle of the channels 29, as this dimension of the “additional plating layer” is greater in thickness than the height dimension of the “thin-film plating layer”. Thus, the limitations of “a thin-film plating layer which is thinner than a desired thickness” (lines 9-10 of Claim 1) are satisfied by Temple’055

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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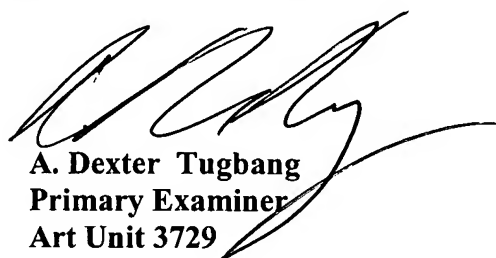
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570.

The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


A. Dexter Tugbang
Primary Examiner
Art Unit 3729

September 29, 2005